

Proceedings of
**1st National Conference on
Current & Emerging Process Technologies**
9th February - 2018

CONCEPT-2018



Department of Chemical Engineering
in Association with
Indian Institute of Chemical Engineers
KEC Student Chapter



Kongu Engineering College
(Autonomous)

Perundurai, Erode - 638 060. Tamilnadu.



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1st National Conference on Current & Emerging Process Technologies

CONCEPT – 2018

SUSTAINABLE FUTURE

February 9, 2018



KONGU ENGINEERING COLLEGE

(AUTONOMOUS)

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PERUNDURAI ERODE - 638 052 TAMILNADU INDIA



Transform Yourself

A. VENKATACHALAM B.Sc.,
CORRESPONDENT

MESSAGE

I feel very glad to note that IIChE – KEC Student Chapter and Department of Chemical Engineering, Kongu Engineering College is organizing its 1st National Conference on Current & Emerging Process Technologies 'CONCEPT-2018' on 9th February, 2018.

The Department of Chemical Engineering excels in research and higher education by address if the needs of phenomenally growing Chemical Industries. I am confident that this technical conference will serve as an ideal platform for the faculty / students of chemical and related disciplines to exchange their ideas and views. It will also help them in upgrading their knowledge and keep in touch with recent developments.

I congratulate the faculty and the students of Chemical Department for undertaking this new endeavor.

I wish this event a grand success



A. Venkatachalam
7/2/18
CORRESPONDENT

Phone : 04294 - 226555, 222181 Fax : 04294 - 220087 Mobile : 98652 13077
Website : www.kongu.ac.in





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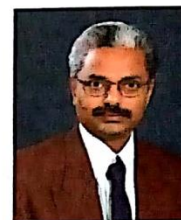


Prof. S. KUPPUSWAMI

B.E., M.Sc.Engg., Dr.Ing.(France)
PRINCIPAL

MESSAGE

I am delighted to learn that IICHE – KEC Student Chapter and Department of Chemical Engineering, Kongu Engineering College is organizing its 1st National Conference on Current & Emerging Process Technologies 'CONCEPT-2018' on 9th February, 2018.



The field of chemical Engineering and related disciplines have evolved to meet the challenges in the industries and society. It is important to expose the budding engineers to advance in this field. This conference provides a platform for academicians / students across the nation to interact with each other and to share their knowledge.

I congratulate the faculty and the students of Chemical Engineering Department for their hard work in organizing this event.

I wish CONCEPT-2018 a grand success.

S. Kuppuswami
7/2/18
PRINCIPAL



Phone : +91 - 4294 - 226511 (P) +91 - 4294 - 220583 (O) + 91 - 4294 - 220630 (R)

Mobile : 99428 20583 Fax : +91 - 4294 - 220087

E-mail : principal@kongu.ac.in skswami@kongu.ac.in Website : www.kongu.ac.in





KONGU ENGINEERING COLLEGE

(Affiliated to Anna University, Chennai)

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Dr. K. SARAVANAN, M.Tech., Ph.D., (Tech)

D.H.R.M., D.I. Safety, P.G.D.B.I.,

Professor & Head

Department of Chemical Engineering

Telephone : 91 - 4294 - 226600 (O)

: 91 - 4294 - 225797 (R)

Fax : 91 - 4294 - 226600

e-mail : saran@kongu.ac.in
: rumisivaesh@yahoo.com

Website : www.kongu.ac.in



MESSAGE



Innovations, inventions and subsequent developments in various fields of science and technology paved the way to the sophisticated life we live. However, each and every technology has its own inherent merits and demerits which need to be addressed at times. CONCEPT-2018: National Conference on Current & Emerging Process Technologies is the first edition of the National Conference, organized by the Department of Chemical Engineering and IChE-KEC Student Chapter, which provides a platform to exchange and update the significant developments taken place in the fields of modern science and technology and to discuss the issues and challenges thereof.

I am pleased to be a part of the conference CONCEPT-2018. I am thankful to the faculty, staff and students who made this function a remarkable one.


HOD/Chemical Engg



ABOUT THE INSTITUTE

Kongu Engineering College (KEC) was established in the year 1984. Approved by AICTE, New Delhi and affiliated to Anna University, Chennai. The Institution has completed 33 years of dedicated and excellent service in the field of technical education. The Institution offers 14 UG, 19 PG and 16 Research programmes in Engineering, Applied Sciences and Management branches. The Institution is one among the best self-financing engineering colleges imparting high quality technical education in Tamil Nadu and is rated 3rd among all self-financing colleges in India and 46th among all Engineering Colleges including IITs & NITs in India by MHRD & NIRF. The Institution has got NBA accreditation for all UG programme and is also ISO certified. It has also got the Best Engineering College award and the Best Principal Award. The Technology Business Incubator was established in the Institution with sponsorship from DST.

ABOUT THE DEPARTMENT

The Department of Chemical Engineering was started in the academic year 1994 -1995 and offers B.Tech., and M.Tech., Degree programmes in Chemical Engineering. This department is one of the recognized research centers by the Anna University, Chennai. Well-equipped laboratories with advanced simulation software's like ASPEN, HYSYS, HTRI, gPROM and ProSIM's cater to the interests of aspiring students. The department focuses on imparting students with excellent technical knowledge to meet the needs of industries and research as well. The Indian Institute of Chemical Engineers Student Chapter, Kongu Engineering College started in the year 2001 aims to promote advancement of Chemical Engineering Science among the students and professionals.

ABOUT IIChE

Indian Institute of Chemical Engineers was born just before the Indian Independence during the days fomenting with nationalistic inspirations. Dr Hira Lal Roy, the great visionary and pioneer of chemical engineering in India, along with few other stalwarts felt the need for such a forum within the country to rear the nascent initiatives for spread of chemical engineering education and foster the interest of the profession. A modest beginning was made on 18 May 1947 in a room of Jadavpur University, Kolkata, with 30 members, little fund and nominal infrastructure. Today, around 15,000 members are on its roll, the Institute has emerged as the apex professional body of chemical engineering professionals in India. The objectives of the Institute within their respective territorial limits, by organizing meetings, conferences and seminars; arranging workshops, refresher courses and counseling sessions; promoting research; guiding chemical engineering students in career planning; and initiating any other activities which are of social, technical and professional relevance to their members.



ABOUT THE CONFERENCE

The continuous growth in population and the rapid industrialization lead to the degradation of the quality of the environment to a noticeable extent and the prominent change in The National Conference on Current & Emerging Process Technologies CONCEPT-2018 aims at bringing together the leading academic scientists, industrial persons, researchers and UG, PG students of AICTE approved Engineering colleges and UGC approved Arts & Science and pharmacy colleges to exchange and share their experiences and research outcomes in the aspects of emerging and advanced process technologies.

Our Major Domains are

- | | |
|---|---|
| 1. Advanced Separation Technologies | 9. Polymers & Composites |
| 2. Catalysis & Reaction Engineering | 10. Petroleum Refining & Petrochemicals |
| 3. Biochemical Engineering | 11. Process Instrumentation, Control & Automation |
| 4. Chemical Process Technology & Safety | 12. Waste Water Treatment, Reuse & Recycle |
| 5. Renewable Energy | 13. Metallurgy & Material Technology |
| 6. Green Chemistry | 14. Process Modelling, Simulation & Optimization |
| 7. Nanotechnology | 15. Others - include advances in science , |
| 8. Food & Nutrition | engineering and technology |

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AGENDA

Venue : Maharaja Auditorium

Date : 09/02/2018

09.30am-09.35am	PRAYER SONG
09.35am-09.40am	LIGHTING THE KUTHUVILAKU
09.40am-09.45am	WELCOME ADDRESS Dr. K.Saravanan M.Tech.,Ph.D.(Tech) Professor & HOD/Chemical
09.45am-09.50am	PRINCIPAL ADDRESS Prof.S.Kuppuswami B.E., M.Sc(Engg)., Dr. Ing (France) FIE Principal, Kongu Engineering College
09.50am-09.55am	PRESIDENTIAL ADDRESS Thiru.A.Venkatachalam, B.Sc., Correspondent, Kongu Engineering College
09.55am-10.05am	INTRODUCTION OF CHIEF GUEST
10.05am-10.10am	HONOURING THE CHIEF GUEST
10.10am-10.20am	CHIEF GUEST ADDRESS Dr.N.Balasubramanian M.Tech.,Ph.D. IIChE Council Member Professor-Dept. of Chemical Engineering, Anna Univeristy Chennai Dr.K.B.Radhakrishnan M.Tech.,Ph.D. IIChE Council Member, Professor & Head Dept. of Chemical Engineering, TKM College of Engineering, Kollam.
10.20am-10.25am	RELEASE OF THE CONFERENCE PROCEEDINGS
10.30am-01.00pm	TECHNICAL SESSIONS
01:00pm-01:45pm	LUNCH
01:45pm-04:00pm	TECHNICAL SESSIONS
04:00pm-04:30pm	VALEDICTORY



INVITED SPEAKERS

Dr.N.Balasubramanian M.Tech.,Ph.D.
IIChE Council Member
Professor-Dept. of Chemical Engineering,
Anna Univeristy, Chennai.



He completed B.Tech Chemical Engineering, CIT Coimbatore. He finished his M.Tech and Ph.D in Chemical Engineering from NIT Trichy and IIT Madras respectively. He has more than 23 years of experience in teaching and research. Currently, he is working as a Professor in Department of Chemical Engineering at A.C.Tech Campus, Anna University, Chennai. He has several publications in various International Journals and has presented many papers. He has been the recipient of various awards and honours including Distinguished PVC's award for Excellence in Research from Monash University Sunway, Malaysia. He is an expert in Development of Membrane Bioreactor and Electrochemical treatment of organic effluent. He is also member of Indian Institute of Chemical Engineers.

Dr.K.B.Radhakrishnan M.Tech.,Ph.D.
IIChE Council Member,
Professor & Head Dept. of Chemical Engineering,
TKM College of Engineering, Kollam.



He completed B.Tech Chemical Engineering with first class honors from Govt. Engineering College Thrissur in 1984 and M.Tech & Ph.D from IIT Madras in 1991 and 1996 respectively. He has more than 33 years of professional experience including teaching and in industry. Currently, he is the Head of the Chemical Engineering department, TKM College of Engineering. He was the Vice-Chairman and Chairman of IIChE, Trivandrum Regional Centre from 2008 to 2010. He has several publications in International Journals and presented many papers in international and national conferences. He is serving as a technical expert under Local Self Government Departments of the Government of Kerala. He is the Convener of curriculum committee in Chemical Engineering of the Kerala Technological University. He is serving as the Chairman of the Board of Examinations of the Chemical Engineering, Biotechnology & Biochemical Engineering of the University of Kerala since 2016.

ORAL PRESENTATIONS

BCE0104

BIOTREATMENT OF REAL FIELD WASTE WATER USING MICROORGANISMS IN SPOUTED BED BIO REACTOR

Samson Prince H, Vignesh B

*Department of Biotechnology, Karunya Institute of Technology & Sciences, Karunya University,
Coimbatore-641 114.*

Email: samsonh@karunya.edu.in, vignesh140007@gmail.com

Abstract

The bio-treatment of real field wastewater by using microorganisms in spouted bed bioreactor is studied in this project. Activated sludge was used as the biocatalyst immobilized in bio-carrier matrices prepared by the reinforcement of a natural polysaccharide sodium alginate with polyvinyl alcohol. The group of microorganism in the mixed form is used as the biocatalyst in different ratio. These immobilized cells are also been to the types of chemical solution to exhibit the activities. For comparison purposes, mixed free cells were also tested. The result demonstrated that the percentage removal of COD and total petroleum hydrocarbons in the real-field wastewater were 61.7% and 66.6%, respectively. The immobilized cells were used up to 3 cycles without losing their efficiency for COD removal. On the other hand, only 28% removal of COD was observed by using non-recyclable mixed free cell. Also, the result proved that the storage stability of immobilized cells maintained at 90% after being stored for 35 days at 40°C, whereby, the free cells became inactive after 28 days. The effectiveness factor μ was found to be 0.991. In the review of literature we had found that waste water treatment using oil and sewage eating microorganisms which is most useful in upcoming generations to protect the environmental pollution causing due to domestic and industrial waste water.

Keywords: *Spouted Bed Reactor, Immobilized Cells, Non-recyclable, Mixed free cell, Effluents.*

BCE0105

GREEN TECHNICAL METHODS FOR TREATMENT OF WASTE WATER USING MICROALGAE AND ITS APPLICATION IN THE MANAGEMENT OF NATURAL WATER RESOURCES

Pranesh.A.S, Ebin Abraham. O

*Department of Biotechnology, Karunya Institute of Technology & Sciences, Karunya University,
Coimbatore-641 114.*

Email: praneshs@karunya.edu.in, ebina@karunya.edu.in

Abstract

Water covers 71% of the Earth's surface, and is vital for all known forms of life. But only 2.5% of the Earth's water is fresh water. Due to industrialization and urbanization it is becoming more polluted and risk of this polluted water consumption and its sanitation problem is increasing day to day in most of the developing countries. Microalgae have the natural wastewater treatment properties. It has the self-cleansing power and it can abstract Nitrate 99%, sulphate 84% and Phosphate 73% for its growth and development. In review of literature we found that waste water treatment using microalgae has number of

positive applications over the conventional methods it should be applied in all developing and developed countries for wastewater treatment so as to protect the environmental pollution causing due to waste water from urban and industries.

Keywords: *Industrialization, Urbanization, Sanitation, Microalgae*

BCE0107

**FUNGAL CHITINASES FROM TRICHODERMA SPECIES: A
SOLUTION OF INTEGRATED PEST MANAGEMENT (IPM)**

S. Amal Dhivahar, R. Ramesh Siva

*Department of Biotechnology, Karunya Institute of Technology & Sciences, Karunya University,
Coimbatore-641 114.*

Email: amals@karunya.edu.in, rameshsivaramalingam@gmail.com

Abstract

The gloomy impact of the massive use of synthetic pesticides on the environment and on human health has initiated the search for environment- friendly practices for controlling plant diseases and pests. Generally, bio pesticides are made of living things, come from living things, or they are found in nature. They tend to pose fewer risks than conventional chemicals. Very small quantities can be effective and they tend to break down more quickly, which means less pollution. Chitinases are particularly attractive to this purpose since they have fungicidal, insecticidal, and nematocidal activities. Trichoderma is a genus of fungi that is present in all soils, where they are the most prevalent culturable fungi. Many species in this genus can be characterized as opportunistic avirulent plant symbionts. Chitinases are harmless for plants and vertebrates that do not contain chitin. Uncovering novel chitinase from untapped microbial diversity potentiates bio control. Bio pesticides can exert fungicidal, insecticidal, or nematocidal action, a combination of them and possibly other auxiliary functions such as bird and mammal repellents or herbicides. They do not contain chitin as an intrinsic component of their cells, chitinase play a major role in fungal cell wall modulation during cell division, growth, and morphogenesis and therefore all fungi possess several different chitinase.

Keywords: *Bio pesticides, Trichoderma, Chitinase, Culturable, fungicidal, Insecticidal, Nematocidal*

CPTS0101

**PERFORMANCE ANALYSIS OF CONDENSER SUB COOLING EFFECTS
ON VAPOR COMPRESSION REFRIGERATION SYSTEM**

Dr.R.Vijayan, M.Surendar, S.Basith, Ahamed, K.Sugumar

*Department of Mechanical Engineering, Government College of Engineering,
Salem-636011, Tamil Nadu.*

Email: vrajnan@yahoo.co.in, surendar2993@gmail.com, basithmech6@gmail.com

Abstract

In this paper, a theoretical study of the condenser sub cooling effects on the performance of vapour compression refrigeration system is presented. Generally condenser sub cooling temperature varies with environment conditions. An alternative system architecture, which utilize a Secondary Condenser Coil, is used to obtain a desired sub cooling temperature. An analysis methodology helps to determine the Coefficient of Performance of the refrigeration cycle with sub cooling for various refrigerants. The performance of R134a with high GWP is compared to different low GWP hydrocarbon refrigerant mixtures with various proportions. Simulation result shows that, the increase in sub cooling temperature, which maximizes the COP of the system and refrigerating effect and minimizes the power consumption and isentropic compression work. On the other hand, the refrigerant blends of R600/R1270/R290 (20/70/10 by wt.%) and R600/R1270/R290 (20/60/20 by wt.%) are gives the desirable results in all stages of readings and also they are found to be most suitable alternative refrigerants for existing R134a in vapour compression refrigeration system.

Keywords: Vapor Compression system, Sub cooling, secondary condenser coil, COP, Alternative refrigerants

CPTS0103

**EXPERIMENTAL STUDY ON ENHANCEMENT OF POOL BOILING
HEAT TRANSFER USING AQUEOUS AMMONIUM
CHLORIDE SOLUTION**

Dr.R.Vijayan¹, M.Surendar², K.Sugumar², S.Basith Ahamed²

¹*Professor and Head & Department of Mechanical Engineering, Government College of Engineering,
Salem-636011, Tamil Nadu.*

²*PG Scholar, Department of Mechanical Engineering, Government College of Engineering, Salem-
636011, Tamil Nadu.*

Email: vrajnan@yahoo.co.in, surendar2993@gmail.com, kmbssugumar@gmail.com,
basithmech6@gmail.com

Abstract

Saturated pool boiling of aqueous ammonium chloride (an innovative non-ionic surfactant) solutions, on a copper wire heater was studied experimentally. Pool boiling experiments were started by boiling pure (distilled) water. After that, pure water was replaced by the aqueous surfactant solution by 500, 1000, 1500, 2000, 2500, 3000 ppm on weight basis. The drop volume method was used to measure surface tension of aqueous solution. The experiments of aqueous surfactant solution were conducted under the same conditions of base line experiment. The boiling behaviour was studied by using high speed video

technique. Pool boiling curves for various concentrations were obtained and compared. Pool boiling performance was found to be enhanced significantly by the addition of ammonium chloride relative to pure water. An optimum level of enhancement was observed in solutions at 2500ppm, which was critical micelle concentration (CMC) of the surfactant. No enhancement was observed in higher concentration solutions. It was observed that addition of ammonium chloride into pure water reduces its surface tension considerably which in turn enhances heat transfer.

Keywords: Pool boiling, CMC, surface tension, heat transfer, surfactant.

CPTS0104

EXPERIMENTAL ANALYSIS OF HEAT TRANSFER IN CLAY BRICK AND FLY ASHBRICK WALL

Dr.M.Raja, K.Suryaprakash

Department of Mechanical Engineering, Government College of Engineering,
Salem-636011, Tamil Nadu.

Email: raaj.nml@gmail.com, akssuryaprakash@gmail.com

Abstract

Heat transfer in wall plays an important role in maintaining the building internal temperature. The main parameters for selecting the brick are its compressive strength and thermal conductivity. The thermal conductivity of the brick must be low in order to keep the temperature inside the room low. The walls are built using various bricks like clay brick, fly ash brick and hollow bricks and experiments were conducted to analyse their thermal characteristics and compressive strength. From the results, it is observed that the fly ash brick have 33% higher compressive strength than that of clay brick and the heat transfer rate of fly ash brick is 7% lower than that of clay brick. Hence it is good to use fly ash brick compared to clay brick for constructing building.

Keywords: Clay and Fly ash Bricks, Thermal Conductivity, Heat transfer

CPTS0107

IMPROVING THE EMISSION CHARACTERISTICS OF A DI DIESEL ENGINE USING PARTICULATE FILTER

IyerRajkumarKrishnamurthy,Bharat.D

Department of Mechanical Engineering, R.M.K. College of Engineering and Technology, Pudukottai,
Thiruvallur, Tamil Nadu

Email: iyerrajkumar1997@gmail.com, bharatdc6@gmail.com

Abstract

Diesel engines provide high efficiency, durability and reliability along with their low-operating cost. These important features make them the most preferred engines especially for heavy-duty vehicles. Diesel engines are considered as one of the largest contributors to environmental pollution caused by exhaust emissions and they are responsible for several health problems as well. Many types of research have been carried out on both diesel exhaust pollutant emissions and after treatment emission control technologies. The four main pollutant emissions from diesel engines are carbon monoxide (CO), Hydro Carbons (HC), particulate matter (PM), nitrogen oxides (NO_x). Control systems for these emissions are diesel filters

(paper type diesel filter and cloth type diesel filters) which are discussed. The harmful gases are reduced by placing the filters in a series cum parallel manner. By this, the back pressure also gets reduced to some extent.

Keywords: *Diesel Engine, Performance, Emission, Filters, Back pressure*

CPTS0108

PERFORMANCE STUDIES ON SHELL AND TUBE HEAT EXCHANGER USING INSERTS

G.Suthakar, R.Balasubramani

Department of Chemical Engineering, Kongu Engineering College, Perundurai, Erode-638 060.

Email: sutha_gt@rediffmail.com, rbalasubramani@kongu.ac.in

Abstract

The present paper deals attempt with the design and simulation of a shell and tube heat exchanger (1, 2) in counter-flow arrangement. This project focuses the selection of different tube inserts, and makes comparison on the heat transfer coefficient for the two most common tube inserts: twisted tape and wire coil insert with and without baffles. In this research work, different fluids are used to study the characteristics regarding shell and tube heat exchanger. With respect to the quality of solution, it has been found that Simulation tool has a paramount position for the following areas of study in the heat exchangers such as unequal fluid flow, pressure drop, turbulence of fluid, temperature difference between two fluid, thickness of material, flow rate of fluid and thermal analysis in the design and optimization phase. A CFD (computational fluid dynamics) model HTRI has been used to predict the temperature distribution in steady-state conditions in shell and tube heat exchanger as well as fluid temperatures at exit of flow channels in transient condition. The simulated results obtained by the CFD model have been compared with the experimental data from the literature, which shows that the CFD model developed in this study is capable of predicting the steady-state and transient performance of the shell and tube heat exchangers satisfactorily. Various design modifications which are implemented and studied through simulation software or compared with experimental and numerically.

Keywords: *Simulation, Heat Exchangers, Heat transfer coefficient, Inserts, Pressure drop*

CPTS0109

**STUDIES ON MIXING TIME IN JET MIXER WITH
NEWTONIAN FLUIDS**

Dr.K.Saravanan¹, G.Mugaishudeen¹, G.Mohankumar^{2*}

¹*Department of Chemical Engineering, Kongu Engineering College, Erode-638 060*

^{2*}*Department of Chemical Engineering, Nandha Engineering College, Erode-638 052*

Email: hod_chem@kongu.ac.in, g.mugaishudeen@gmail.com, hod.chemicalnec@gmail.com

Abstract

Mixing is an important unit operation that involves manipulation of a heterogeneous physical system with the intent to make it more homogeneous in process industries. Conventional mixers are equipped with impellers but are expensive for mixing in large storage tanks and underground tanks. Jet mixers have become an alternative to impellers for over 50 years in the process industries. For the design of jet mixers, the detailed hydrodynamics of the mixing process is not properly understood. In the present paper, mixing studies were carried out in a cylindrical tank. The flow circulation patterns within the tank and their effect on mixing of a soluble salt are studied. An experiment was carried out to study the effects of various parameters such as nozzle diameter, jet position and jet velocity on mixing time. Results show that, for a given geometric arrangement, jet diameter is significantly more important in determining mixing time for Newtonian fluids...

Keywords: *Jet mixer, Mixing time, Jet diameter, Jet position, Newtonian fluids, Power consumption*

CPTS0110

**AGITATED FLUIDIZATION OF SOLIDS USING
MECHANICAL STIRRING**

R.Akshaya, N.DeepaPriya, Dr.K.Saravanan

*Department of Chemical Engineering, Kongu Engineering College, Perundurai, Erode-638 060,
Tamil Nadu, India*

Email: akshayamtech001@gmail.com, dppriya1984@gmail.com, rumisivaesh@yahoo.com

Abstract

Fluidization is a result of exposing a granular solid to an up flowing gas or liquid so that the heterogeneous system has the properties of fluid. Effective fluidization quality is needed for ensuring gas-solid contact, excellent heat and mass transfer. Aeration of bed can give better fluidization but too much aeration leads to bubble formation and slugging. So along with aeration, mechanical stirring was introduced to fluidized beds aiming better fluidization performance. Stirring increases bed bulk density reduces minimum fluidization velocity and porosity. The performance of fluidized bed can be understood from the gas and solids hydrodynamics - solids hold-up, mixing and velocity distribution. The present work focuses on the hydrodynamics study of stirred fluidized bed.

Keywords: *Stirred fluidized bed, Hydrodynamics, Minimum Fluidization, Pressure drop*

CPTS0111

**SORPTION OF CADMIUM ONTO RED ALGAE – OPTIMIZATION,
ISOTHERM AND KINETIC STUDIES**

V.Jayakumar^{1*}, S.Govindaradjane²

^{1*}*Department of Chemical Engineering, Motilal Nehru Government Polytechnic College, Pudhucherry-605008, India*

²*Department of Civil Engineering, Pondicherry Engineering, College, Pudhucherry-605014*

Email: jayakumar1518@gmail.com, sg@pec.edu

Abstract

In this study, Box-Behnken Design (BBD) was employed to optimize the conditions of independent variables pH (3-6), bio sorbent dosage (0.5-2.5 g/L), and agitation speed (60-100rpm) for the removal of Cadmium (II) ions from the aqueous solutions using novel marine red biomass as efficient, eco-friendly and low cost adsorbent. Under these conditions, the response (the adsorption percentage of cadmium) was fitted by a quadratic polynomial regression model and linear model analysis in three-level-three-factor BBD using Design Expert software. The optimum conditions of operating variables for the maximum cadmium percentage sorption were found to be 4.6, 1.67g/L and 81 rpm for pH, bio sorbent dosage and agitation speed, respectively. At the optimal operating conditions, studies were carried out for effects with respect to various concentrations of cadmium and time. Isotherm and kinetics studies were also performed for the sorption of cadmium metal ions.

Keywords: Red biomass, Biosorption, Response surface methodology, Heavy metal cadmium

PRP0101

BIO-COALESCE OF MOTOR SPIRIT

Sundhar.JA AbdulKalam Azad A, Nithin Krishna P K Avinothini.V B

SVS College of Engineering, Coimbatore

Email: sundharshock007@gmail.com, vinothinivino92@gmail.com

Abstract

It is probably known fact that from the earlier to current scenario that petroleum (motor spirit) is upshot from crude oil or rock oil, which is a non-renewable resource. Since the current globalization research is on the chase of exploration of crude source-based products (petrol). We are pushed to the extend and in a situation to lay our fingers to come up with a solution for it, in order to make it available for the upcoming future needs. As the regeneration of crude source by a natural process is impossible to face the current needs of the fast-moving global requirement, so an alternative way to produce motor spirit is essentially important. Though there are many ways to produce petrol, the availability of source for the production of petrol is not reliable and economic way to meet the future needs. Focusing on the phenomena that the hydrocarbon source in a compound can be customized into another hydrocarbon product under various temperature and pressure based on the requirements of the consumer-hold product and if the carbon content in a compound increases, the calorific value of the compound will also increase. Based on the facts mentioned above, our ideology of extracting motor spirit for our day to day waste which are rich in hydrocarbon sources will be helpful in a more successful and an economic path towards

the production of petrol. If the suggested way is implemented then it will play a major rule in there duction of biological waste and also an effective means for the production of petrol.“Why not we put a waste to use?”

Key Words:Crude oil, Motor spirit, Biological waste, Carbon content,

PRP0102

COMPARATIVE STUDIES OF THERMALLY TREATED AND RAW VEGETABLE OIL IN DIESEL BLEND

Santhiya.P¹, Shanmugam.P², Kannan.K³

¹SanthiyaPalanisamy, PG Scholar in Chemical Engineering

²Shanmugam P, Assistant Professor Department of Chemical, Kongu Engineering College

³Kannan K, Professor Department of Chemical Engineering, Kongu Engineering College

Email:¹santhiya019@gmail.com, ²shapal.chem@kongu.ac.in, ³kannank@kongu.ac.in

Abstract

The thermal cracking of palm oil, sunflower oil and neem oil were evaluated for the production of biofuels as an alternative to fossil fuels. This study includes the test of thermal decomposition for the biofuel production from vegetable oil. Thus an attempt has been made to study the vegetable oil with and without inert material in a batch reactor. The experiments were carried out under at a temperature of 150 to 350 o C and atmosphere pressure. After the thermal cracking of vegetable oil to study about the decarboxylation(DCOX), decarbonylation(DCO), polymerization and aromatization of treated vegetable oil. From the results we are comparing the studies of the exhaust gas from diesel engine using diesel and raw/ treated vegetable oil blend and also compare the physical characteristics of the product obtained (density, specific gravity, higher heat value, flash point and kinematic viscosity), were in line with ASTM D6751 (B100) standards.

Keywords : Thermal cracking, vegetable oil, 13-X zeolite, ASTM

PC0101

A REVIEW ON TRIBOLOGICAL BEHAVIORS OF STIR CAST ALUMINIUM MATRIX COMPOSITES

M.Karthikeyan¹, K.Renuga Devi^{2*}, M. Monisha^{2*}

¹ Assistant Professor, Department of Mechanical Engineering, AAA College of Engineering and Technology, Sivakasi

² UG Scholar Department of Mechanical Engineering, AAA College of Engineering and Technology, Sivakasi

Email:sylph¹karthik13@gmail.com,²renudevi97eee@gmail.com,
monishamurugan17@gmail.com

Abstract

Aluminium hybrid composites are a new generation of metal matrix composites that have the potentials of satisfying the recent demands of advanced engineering applications due to their improved mechanical properties, amenability to conventional processing technique and possibility of reducing production cost

of aluminium hybrid composites. Reinforcements like particulate alumina, silicon carbide, graphite, fly ash etc can easily be incorporated in the melt using cheap and widely available stir casting method. This Paper attempts to review the different combination of reinforcing materials used in the processing of hybrid aluminium matrix composites and how it affects the wear performance of the materials. The major techniques for fabricating these materials are briefly discussed and research areas for further improvement on aluminium hybrid composites are suggested. This review focuses on the recent development in tribological behavior of self-lubricating aluminium matrix composites. It includes development of self-lubricating nanocomposites, related issues in their processing, their characterization, and investigation of their tribological behavior. The mechanisms involved for the improved tribological behavior is discussed.

Keywords: Aluminium Matrix Composites, Stir Casting, Tribology

PC0103

**INVESTIGATION OF ALUMINIUM MAGNESITE METAL MATRIX
COMPOSITES DESIGN**

R.Selvarasan, P.Mohan, C.Palanisamy

Department of Mechanical Engineering, Government college of Engineering, Salem-11

Email: rajaselvarasan@gmail.com, mohanpachamuthu@gmail.com,
palanisamychinnathambi@gmail.com

Abstract

Magnesite Mineral Ore is an essential raw material for manufacturing Refractory Materials used by Steel Industry. This is a rare mineral available in Salem Region of Tamil Nadu State and also found in other states like Uttaranchal, Karnataka and Jammu and Kashmir. Magnesite of Salem Region is relatively low in Calcium Oxide. Salem Magnesite Reserves are famous worldwide for its Cryptocrystalline Structure, which is best suited for manufacturing Refractory Bricks. There are many grades of magnesites are available like lightly calcined magnesite, dead burned magnesite, dunite and also magnesium oxide percentage related grades of magnesite powders are available. To investigate microstructure & chemical composition of using SEM images and EDX values for suitability of metal matrix composite and also combined with aluminum to fabricate a plate using casting. To conduct wear and hardness test for the composite material further analysis were done.

Keywords: SEM, EDX, Aluminium, Magnesite, Cryptocrystalline Structure.

PC0105

**EXPERIMENTAL STUDY OF NI- TIC NANO COMPOSITE COATING ON MILD STEEL 1018
BY ELECTRODEPOSITION**

R.Niranjan^{1*}, R. Rontgen², C.Palanisamy¹

^{1*} PG Scholar (M.E CAD-Mechanical Engineering) & Government College of Engineering Salem-
11 (Corresponding Author)

² UG scholar (B.E- Mechanical Engineering) & Shreenivasa Engineering college Dharmapuri

Email: r.niran1994engineer@gmail.com,
er.niranjanmech@gmail.com, palanisamy chinnathambi@gmail.com

Abstract

Nowadays, synergy of the attractive properties of materials while avoiding limitations of their use in isolation is a major driver for flexibility in design and manufacture. This allows tailoring of materials' properties to meet specifications. Composite technology utilizes an excellent combination of properties: strength, stiffness, light weight, wear, chemical, corrosion, and temperature resistance, which transcend those of the constituent materials. Engineering structures, equipment, and vessels in key industries that are material dependent are susceptible to deterioration process and damage over time in their service conditions. Composite coatings through electro-deposition offer a reliable cost-effective means of imparting special surface properties for corrosion protection, better appearance, and mechanical properties' enhancement. The properties of the composite coatings can be optimized by varying the type, size, amount and distribution of the particles content incorporated among others.

Keywords : *Electro-deposition, nanocomposite coatings, wear resistance, micro hardness.*

PC0110

**PREPARATION OF SILICA CRYOGEL INFUSING FIBRE BLANKET
BY VACUUM DRYING**

Kiruthika.R.L, Periasamy Manikandan.A.S

Department of Chemical Engineering, Kongu Engineering College, Perundurai Erode
kirthiraj1811@gmail.com, aspm@kongu.ac.in

Abstract

Silica cryogel-glass fiber composites with a high specific surface area and high mesoporosity were fabricated via a simple still original drying technique. The ratio of solvent/silica loading significantly affected the porous structure and thermal insulating properties of the blanket. From the results of BET surface area, apparent density and porosity studies, the microstructures and specific surface areas of the composites were greatly affected by changing the silica amount in the sol. The microstructure of silica cryogel blanket exhibits a porous structure consisting of glass fibers of diameter 3~7 μm interconnected with solid silica clusters (5–20 μm). Silica cryogel-glass fiber blankets with low densities from 0.13–0.24 g/cm and thermal conductivity as low as 0.02–0.035 W/mK were obtained using this cost effective, hazardous free and time saving method. The pH of the silica sol influenced the gelling property and the thermal conductivity of the composites.

Keywords : *Silica sol, cryogel, BET, Thermal conductivity*

RE0102

**INVESTIGATION TO IMPROVE THE EFFICIENCY OF
PHOTOVOLTAIC MODULE USING PHASE CHANGE MATERIALS: A
REVIEW**

Dr.M.Raja¹, P.Sarathkumar^{2*}

Department of Mechanical Engineering, Government College of Engineering, Salem-11, Tamil Nadu .

Email:raaj.nml@gmail.com, jsamsarathaero@gmail.com

Abstract

Solar photovoltaic cells can absorb up to 80% of the incident solar radiation obtained from the solar band. However, only a small amount of this absorbed incident energy is transferred into electricity depending on the conversion efficiency of the PV cells. The part of the remaining energy increases the temperature of the PV cell. The higher solar radiation and ambient temperature lead to an evaluated photovoltaic cell operating temperature, which affects lifespan and power output adversely. Using of phase change materials (PCMs) is one of the most promising tools to reduce and regulate the temperature of PV panel and to increase its electrical efficiency. Results show that adding PCMs on a back of a solar panel can maintain the panel operating temperature nearly equal to the ambient temperature and it was shown that electrical efficiency of PV panels has been increased by compare to the conventional PV panel

.Keywords: *Solar radiation, PCM, Electrical efficiency*

RE0107

**PERFORMANCE OF A FORCED CONVECTION SOLAR
DRYER INTEGRATED WITH LATENT HEAT STORAGE UNIT**

Dr.S.Sivalakshmi¹, S.Karthi^{2*}

¹*Assistant Professor, Department of Mechanical Engg., Government College of Engineering, Salem..*

^{2*}*PG Scholar, M.E Thermal Engineering, Government College of Engineering, Salem-11.*

Email: sivalakshmit@gmail.com, magakarathi93@gmail.com

Abstract

This paper presents the performance of a forced convection solar dryer integrated with latent heat storage unit. The main goal was to develop an efficient and cost effective dryer that maintains drying process after sunset. The solar dryer consists of solar air collector, a paraffin wax-based latent heat storage module, a blower, a drying chamber and drying tray. In latent heat storage unit Paraffin Wax is used as the heat storing medium. The effect of using phase change material to store thermal energy during daytime is analyzed. The dryer was tested by drying 1kg of potatoes in the drying air temperature range of 30-57°C. The dryer was operated daily for 5 h from 10:00 h to 15:00 h. The temperature distribution along the dryer chamber for various drying air temperatures, air flow rates, moisture content and drying rate are discussed. The performance of each component of drying system was evaluated.

.Keywords: *Solar air collector, Latent heat storage unit, Phase Change Material.*

RE0108

**DESIGN, FABRICATION AND EXPERIMENTAL ANALYSIS OF
CONCRETE COLLECTOR SOLAR WATER HEATER WITH USE OF
THROTTLE TUBE**

Dass S A¹, Balusamy T²

¹PG Scholar, Government College of Engineering, Salem

²Associate professor, Government College of Engineering, Salem

Email: dass280595@gmail.com, balusamy t@yahoo.com

Abstract

To increase the usage of solar water heaters in India, a low-cost solar collector made of concrete which is experimentally investigated in Salem, using the integrated concrete collector in terrace. The abundant solar energy is used for the domestic purpose. The concrete slab consisting metal fibers is placed in a wooden box, with immersed serpentine copper tube dimension is 1m x 1m x 0.05m. With an objective of improving the efficiency of the collector, a heat transfer augmentation technique (throttle copper tube) is fabricated on water carrying serpentine tube. Testing is carrying on the rainy, winter and summer season for a water flow rate is 0.004167 kg/s to understand the working of collector. The effect of the throttle serpentine copper tube in integrated concrete collector of the solar water heater is tested. Also the effect of the fully embedded of the copper tube in the concrete collector is tested. Testing results show that the average temperature of the collected water per day is 35°C–45°C. Further the experiment is to be conducted to determine the effect of the throttle serpentine copper tube partially embedded in the concrete slab. Also, detailed analysis environmental benefits of concrete collector solar water heater for India are investigated.

Keywords: Solar water heater, integrated concrete collector, throttle copper tube, fully embedded copper tube, partially embedded copper tube.

RE0109

**SYNTHESIS OF ENERGY STORAGE USING GRAPHENE THIN FILM
TECHNIQUE**

Aneetha.MK¹, Kannan.K², Shanmugam.P³

¹Aneetha.MK, Dept. Of chemical engineering; Kongu Engineering College

²Kannan.K, Professor Department of chemical engineering, Kongu Engineering College

³Shanmugam P, Assistant Professor in Dept of chemical engg., Kongu Engineering College

Email anitaneetha@gmail.com, kannan @ kongu.ac.in, shapal.chem@kongu.ac.in

Abstract

An increase in demand for energy has become a major problem facing the world today. In recent years thermoelectric devices have emerged as a promising alternative for renewable energy applications. Thermoelectric materials can transform heat from the sources such as power plants, factories, motor vehicles, computers or even human bodies into electric power. The thermoelectric research using graphene-based materials is rising and has made a progress in recent years. Graphene is an allotrope of carbon in the form of a two dimensional atomic scale, honey comb lattice in which atoms forms each vertex. It is also evident that graphene has excellent electrical and thermal properties. Since graphene are

closely stacked together, they could potentially be used to generate enough power for running ultra-low power operations.

Keywords: *Thermoelectric materials, Graphene, Electric power, Solarcells, Raman spectroscopy*

WWT0102

DESIGN OF BFS IN UPFLOW MODE USING SYNTHETIC WASTEWATER FOR THE OPTIMIZATION OF MICROORGANISMS

¹Dr.K.Senthil Kumar, ²M.Naveen Kumar*

¹Associate Professor, ²Research Scholar, Department of Chemical Engineering,
Kongu Engineering College, Perundurai, Erode, Tamil Nadu

Email: er.naveenmanick@gmail.com

Abstract

Energy is the main requirement of this era. We as a developing country depend on energy for a various purposes. Recently, many nations put forth their initiatives on reducing the usage of polluting fossil fuels. It is well known that as a developing country for us, we are in need of non-polluting biological means of energy like alternative fossil fuels. Our another problem is waste materials produced on various productions in order to couple these two problems researches found technology that uses microbial community to degrade organic compounds in wastewater and to create energy. In this current work an attempt has been made to design a biochemical fuel system in up flow mode using synthetic wastewater which resembles distillery wastewater. The Costs of membrane used in the previous works are eliminated in the design and provisions have been given for various electrode distances. To increase the efficiency of MFC, the cells operate in two conditions of aerobic and anaerobic. Aerated MFC was further studied by varying sludge volume. The maximum power production efficiency was 55%. Utilizing chemical wastewater for the production of renewable energy (electricity) from anaerobic treatment is considered as a feasible, economical and sustainable process

WWT0104

A NOVEL METHODOLOGY FOR HEXA VALENT CHROMIUM REDUCTION FROM WASTEWATER USING POWDERED AND IMMOBILIZED SARACA INDICA LEAVES

Jeenathraj, Vijayakumar, Suhanya

Dept. of Chemical Engineering, Sethu Institute of Technology,
Kariapatti, Virudhunagar District - 626115

Email: jeenathrajmrj777@gmail.com, Vijayakumarsanthosh1111@gmail.com, suhanya@sethu.ac.in

Abstract

Various raw agricultural wastes are available in our environment as a low cost adsorbents. Most of which are easily affordable. In this research, the use of Saraca indica leaves (as an eco-friendly and low cost adsorbent) with no pre-treatment having the ability to reduce toxic Cr (VI) present in aqueous solutions has been investigated. The influences of several parameters such as sorbent amount, initial metal-ion concentration, pH, contact time of powdered and immobilized Saraca indica carried out in batch

and continuous experiments have been studied. The results revealed that Saraca indica adsorbs over 70-90% with increasing adsorbent dosage, with FBR having a maximum removal time of 90 mins. The kinetic models like Langmuir, Freundlich, Temkin and D-R adsorption had been compared and are found to fit to these models. The present study shows that such a low cost adsorbent is used efficiently for Cr(VI) reduction from aqueous solutions.

Keywords : *Low cost, Chromium (VI), Saraca indica, eco-friendly, sorbent, immobilized*

WWT0107

DECOLORIZATION OF DYE WASTE WATER USING AGROWASTE MATERIAL

G.Sampathkumar¹, Dr.K.Saravanan² and Dr.K.Senthil Kumar³

¹ Assistant Professor Department of Chemical Engineering, The Kavery College of Engineering,

² Professor and Head, Department of Chemical Engineering, Kongu Engineering College

³ Associate Professor, Department of Chemical Engineering, Kongu Engineering College

Email: sampathkumar.chemical@gmail.com, rumisivaesh@yahoo.com, uksen2003@gmail.com

Abstract

Water pollution due to release of industrial wastewater has already become a serious problem in almost every industry using dyes to color their products as well as for the survival of lives. Normally wastewater is treated in plants to remove undesirable components which include both organic and inorganic matters, and soluble and insoluble materials. This paper presents the color removal of textile waste water containing dyes using waste material of agro waste. This is easily available in our country and is economical than the adsorbents of other processes used for the treatment of wastewater. The parameters of the experiments include initial concentration of dye, adsorbent amount and adsorption time. For a given composition, the adsorption of dyes in activated charcoal of agro waste increases with amount of adsorbent when operated for equal adsorption time.

FN0104

EFFECT OF THERMO-OXIDATION PROCESS ON THE PHYSIOCHEMICAL PROPERTIES OF MUSTARD OIL

S.RamaJeba, K.Karthikeyan, J.Prakash Maran, R.M.Karthika

*Department of Food Science and Nutrition, Periyar University, Periyar Pakalai Nagar, Salem-636011,
Tamil Nadu, India*

Email: profkarthi@periyaruniversity.ac.in, prakashmaran@periyaruniversity.ac.in

Abstract

The objective of this present study is to investigate the effect of frying process at different temperatures on the physiochemical properties of mustard oil and compared with normal mustard oils physiochemical properties. Physiochemical properties such as density, viscosity, saponification value, acid value, free fatty acids, iodine value, p-anisidine value, peroxide value, un-saponifiable matter were analyzed and determined by IUPAC methods. Fourier transform infrared (FTIR) spectroscopy was used to identify the presence and changes in the functional groups of normal and fried oils. The outcomes of this study clearly indicated that, increase in temperature during frying process leads to form the volatile compounds in the

oils. The formation of aldehyde and ketone compounds in the oils during frying process directly influences and boost up the presence of volatile compounds in the fried oils when compared with normal oil. The presence of volatile compounds in the fried oils changes the functional group of the oil and it was confirmed through FTIR analysis.

Keywords: *Temperature; Volatile Compounds; Mustard oil; Frying; Aldehyde; Ketone.*

MMT0102

MECHANICAL PROPERTIES OF NI-SiC NANO COMPOSITE ELECTRODEPOSITED COATING ON ALUMINIUM 6061 ALLOY

Palanisamy.C, Mohan.P, Selvarasan.R

*Department of Mechanical Engineering, Government College of Engineering,
Salem-636011, Tamil Nadu.*

Email: mohanpachamuthu@gmail.com, palanisamychnnathambi@gmail.com, rajaselvarasan@gmail.com

Abstract

Composite coatings are widely used in various applications generally where the base material is subjected to environment or mechanical wear. Since the composite coatings generally tends to possess improved mechanical properties and extended life time of the coatings it is preferred widely. In recent days there are several research involves around the co-deposition of second phase abrasive particles along with iron group materials. Aluminium alloys possessing unique properties have been extensively used over a long period of time. However, despite the excellent performance of aluminium in anticorrosion conditions, problems continue in protection of aluminium in various environments. The basic idea of this project is to coat nickel and as well as the composite coating of Ni-SiC on aluminium substrate where the silicon carbide was chosen due to the superior mechanical properties. The work deals about the comparison of mechanical properties of the various composite coatings at several modified electrodeposition process parameters.

Keywords : *Electrodeposition process, Ni-SiC coating, Mechanical properties.*

MMT0104

FABRICATION AND CHARACTERIZATION OF SUPER HYDROPHOBIC SURFACE ON MILD STEEL SUBSTRATE

Danielraj.K¹, Monisha.M², RenugaDevi.K²

¹ *Lecturer, Lakshmi Ammal Polytechnic College*

² *UG Scholar, AAA College of Engineering and Technology, Thiruthangal.*

E mail: rajdani297@gmail.com, monishamurugan17@gmail.com, renudevi97eee@gmail.com

Abstract

This study offers greater insight on the anti-icing behaviour of the super hydrophobic mild steel and finds its application in aircraft and corrosion resistance. Super hydrophobic surface has unique characteristics such as water repellence, self-cleaning and anti-icing. In view of developing super hydrophobic film over substrate of mild steel a systematic procedure is developed and proposed in this literature. The various stages of the process including ultrasonic cleaning, chemical etching, hot water treatment, solution immersion technique and heat treatment. In order to prepare the test specimens, the chemical etching and solution immersion time have been varied at five, three different levels respectively. In each category three

samples are considered. The super hydrophobicity is measured by considering surface roughness and surface energy. Rough surface was created by chemical etching process and stearic acid was coated by solution immersion method. The roughness values of the substrate at various stages have been predicted and presented. The obtained contact angle of surface is as high as 158° with low contact angle hysteresis. In addition, the resulting surfaces exhibit excellent anticorrosion; self-cleaning properties, ice-delaying property and they were measured and reported.

Keywords: Super hydrophobic, Contact angle, Corrosion resistance.

MMT0106

THERMAL ANALYSIS OF POLYSTYRENE SHEET PARABOLIC SOLAR COOKER USING DIFFERENT REFLECTIVE MATERIAL

Dr.S.Sivalakshmi,R.Deepak*

*Department of Mechanical Engineering, Government College of Engineering, Salem-11.
Tamil Nadu.*

Email: sivalakshmit@gmail.com, deewagkkcc@gmail.com

Abstract

Due to rapid depletion in the supply of fossil fuels, the solar energy can be the most appropriate option compared to other alternative energy resources. The solar cookers have a relevant place in the present fuel consumption pattern. But the position of the sun varies continuously throughout the day time which affects the absorption rate. In the proposed parabolic solar cooker, the shape will be such that the solar radiation incident upon the surface gets concentrated towards the center of the cooker. The parabolic design of solar cooker has been proposed so that the efficiency of solar cooker would be increased and will enhance the heat transfer rate. In this project an attempt has been made to design and fabricate a parabolic solar cooker using polystyrene sheet along with different reflective materials like Mylar film, Aluminium foil and BOPP (biaxially oriented polypropylene) film as reflective material.

Keywords: Solar cooker, Mylar Film, Aluminium Foil, BOPP Film..

PICA0103

DESIGN AND ANALYSIS OF CONTROLLER FOR AGRICULTURAL ROBOTIC VEHICLE

Dhanasekar R, Pavithra P, Tharini S kumar, Vaishnavi B

*Department of Electronics and Instrumentation Engineering, Bannari Amman Institute of Technology,
Sathyamangalam, Erode*

Email: pavithra.ei14@bitsathy.ac.in, tharinis.ei14@bitsathy.ac.in, vaishnavi.ei14@bitsathy.ac.in

Abstract

The world is optimizing and is becoming more precise by switching from the world of personal computers to laptops to android phones. The purpose of this project is to design and implement a compound robot. The compound robot will be able to move in four directions (left, right, forward, backward) and will detect the distance of the obstacle from the robot on the android app. The main intent of this project is to design and bring about a robot prototype by using Arduino Uno, Motor Driver L293D, HC 05- Bluetooth module and to procure the goal of this project, to gain knowledge about Ultrasonic sensor HC SR04, reconcilable software and controlled motor circuit need to be determined. The

Robot will have several characteristics like continuous display of distance from the obstacle on the app, easy handling of a robot with the help of an app rather than any remote controller.

PICA0104

SEMI AUTOMATIC CEILING FAN CLEANING SYSTEM

D.Aravinthan¹, A.Hariharan¹, B.Ismail¹ S.K.Dinesh²,

¹ *Department of Mechatronics, UG Students, Bannari Amman Institute Of Technology,*

² *Assistant Professor in Bannari Amman Institute Of Technology, Erode, Tamil Nadu*

Email: aravinthan.mc16@bitsathy.ac.in, hariharan19986@gmail.com.

Abstract

This project is aimed to build a Semi-automatic ceiling fan cleaning system to clean the ceiling fan as it is tedious process when peoples involved in the task of ceiling fan cleaning. A Semi-automatic ceiling fan cleaning system consists of various mechanical parts for the movement of the cleaning rollers on the blade of the fan since it moves linearly along the blade of the fan. It reduces the neck pain and saves the time to the peoples who involved in the process of cleaning the ceiling fan since they are forced to move up their head for long time while cleaning. The roller will engage with the blade of the fan and the forward and backward motions are achieved by rotating the upper and bottom roller in the opposite directions. The rotation of the rollers is achieved by the rotation of the motor shaft by connecting the worm gear, which is attached to the motor shaft and the spur gear, which is attached to the roller shaft. The motor is powered by the external power supply and the machine is uplifted manually by the help of the connecting rods at the back of the machine. The pressure between the two rollers leads the roller to clean the dust which is adhered to the blades of the fan. **Keywords:** *Motor, Spur gear, Worm gear, Battery, Roller.*

PCIA0108

ENERGY CONSERVATION IN AIR CONDITIONING SYSTEM USING SMART CONTROL SYSTEM

K.N.Nirmal, M.Kavin, S.Mouli, P.LeninPugalhanthi

E mail: nirmalkn17@gmail.com

Abstract

Because of the industrial growth and the increased standard of living, the supply-demand gap is increased. Providing solution for meeting the energy demand has become the need of the hour. In recent energy scenario, air conditioning system which become a part of the sophisticated life, contributes more for the increasing demand. This paper describes the Smart Control system for the Air Conditioning system, with the focus of reducing the energy consumption. An attempt has been made in this work to develop the ATMEGA Microcontroller based Smart Control system for the air conditioning system. Initially the components of the air conditioning system are modelled using MATLAB/Simulink and the responses are studied in this work. Further the embedded coding for the Microcontroller based Smart control system is developed for the air conditioner and the same has been validated using PROTEUS simulator. Then the

hardware module of the Smart control system using ATMEGA16 Microcontroller is developed and implemented in order to maintain the room temperature by controlling the compressor motor speed. The simulation result using MATLAB software and the response using the hardware module witnesses that the proposed Smart control system is more suitable to be implemented in real time environment.

Keywords: *air conditioning, Microcontroller, Simulink, hardware module*

PICA0109

MULTIVARIABLE PROCESS CONTROL

ArjunSrivats R

PG , final Year, Dept. Of Chemical Engineering (Final year), ACT, Anna University Chennai

E Mail:arjunsrivatsr@yahoo.com

Abstract

Process control systems are an integral part of the operating system of a process plant. The field of process control in chemical engineering has witnessed continuous development over the years, trying to meet the demand for achieving highly accurate and ore efficient process plant operations. A vast majority of control loops in process plants can be designed by well-known single loop control techniques, the implementation being that the inputs to these loops affect only their own outputs and no others in the plant. A fraction of the loops, however are multivariable in nature. In multivariable systems, one input affects not only its own output but also one or more other outputs in the plant, rendering automatic control more difficult. Some examples of multivariable processes are distillation columns, fluid catalytic crackers, boiler furnace systems and polymerization reactors. Although only a small portion of the plant processes are multivariable in nature, good control of these units is indispensable because of their profound influence on final product quality and overall plant economics. In the paper that will be presented, various techniques directed towards design of multivariable control systems will be discussed, to mention a few, there are the relative gain analysis, singular value analysis, multiloop controller design, Inverse and Direct Nyquist arrays, Model predictive control and Internal model control. In addition to these existing techniques, some new techniques, if possible, will be discussed.

PMS0102

FLUID FLOW SIMULATION USING CFD(ANSYS – FLUENT)

Dr.Senthil Kumar K ¹, Dr.Chitra Devi V ², Manjula P ³, Manju Sri A ^{4*}

¹ Kongu Engineering College, Department of Chemical Engineering, Associate Professor

² Kongu Engineering College, Department of Chemical Engineering, Professor

³ Kongu Engineering College, Department of Chemical Engineering, Assistant Professor

⁴ PG Scholar Kongu Engineering College, Department of Chemical Engineering

Email:senthilkumar.chem@kongu.ac.in

Abstract

Process optimization and simulation is gaining more importance in this digital era, as it tremendously saves time and hence improves the economy of the industries. Amongst the simulation techniques, Computational Fluid Dynamics (CFD) with its unique advantages of being problem specific and accuracy of results is employed widely for fluid flow problems. In this context, CFD studies have been attempted on incompressible fluid flows through two different geometries. Experimental work is carried out by

varying flow rates and corresponding pressure drop is estimated. The experimental geometries are simulated and results were obtained using the well-established CFD software, ANSYS FLUENT. This software employs various numerical techniques and turbulence models for different flow regimes. The results thus obtained were validated with the experimental results. This validation paves a concrete way for the selection of simulation strategies for complex fluid flows encountered in real time processes.

Keywords: *Simulation, Fluid flow, CFD, ANSYS FLUENT*

PMS0103

PID Controller Tuning Using ASPEN HYSYS

Bhavatharini.S¹, Abirami.S¹, ArunPremAnand.N²

¹*UG Student, Department of Chemical Engineering, Sri Venkateswara College of Engineering, Sriperumbudur.*

²*Assistant Professor, Department of Chemical Engineering, Sri Venkateswara College of Engineering, Sriperumbudur*

Email:¹ bhavatharini98@gmail.com, ¹ abiramimalarmani@gmail.com, ² arunpremanand@svce.ac.in

Abstract

A system of two tanks in series is considered with water flowing in and out of each of the tanks. It is desired to control the temperature of the water flowing from the second tank by varying the flow rate of hot and cold streams flowing into the first tank. The second order system is approximated a first order system with time delay and the necessary transfer function for the process is formulated. A PID controller is installed to the hot water stream of the first tank. The process reaction curve is obtained experimentally by recording the % change in temperature of the water flowing from the second tank Vs time for a 15% valve opening. The key parameters required for controller tuning namely the proportional gain (K), time delay (α) and time constant (τ) are obtained from the process reaction curve.

Keywords: *Temperature control, PID Controller, Tuning, ASPEN HYSYS.*

OAS0102

AN ENERGY EFFICIENT HETEROGENEOUS RING CLUSTER ROUTING PROTOCOL FOR WIRELESS SENSOR NETWORK

S.Ramya¹, D.Chitra²

¹*PG Scholar, Dept of ECE Mahendra Engineering College, Namakkal, India,*

²*Assistant professor, Dept of ECE, Mahendra Engineering College, Namakkal, India,*

Email: ramyaece.cool@gmail.com, chitrad@mahendra.info

Abstract

A heterogeneous ring domain communication topology with equal area in each ring is presented in this study in an effort to solve the energy balance problem in original RPL (IPv6 Routing Protocol for Low Power and Lossy Networks). A new clustering algorithm and event driven cluster head rotation mechanism are also proposed based on this topology. The Clustering information and clustering message were designed according to RFC and original RPL message structure. An Energy Efficient Heterogeneous

Ring Clustering routing protocol for wireless sensor network is then proposed and corresponding routing maintenance methods are established. Related messages are analyzed in detail. Experimental results show that original RPL, the routing protocol has more energy consumption, thus decreasing both node energy consumption and number of control messages.

Keywords – *wireless sensor network, clustering algorithm, routing algorithm.*

OAS0104

ENERGY EFFICIENT KING-PROTEA BASED DETECTION AND REMOVAL OF BLACK HOLE ATTACKS IN MANET'S

DhivyaPrabha¹, Mr.H.Riasudheen²

¹*Information Science and Tech College of Engineering, Guindy*

²*Anna University, Chennai-600025*

Email: *dhivyaguru87@gmail.com, riasudheen@gmail.com*

Abstract

A Mobile Ad Hoc Networks is an autonomous system of mobile nodes a kind of wireless networks where the mobile nodes dynamically from a network to exchange information without utilizing any pre-existing fixed network infrastructure. Manet suffer from various types of security attacks and probabilistic approach is proposed to detect and remove the black hole attack node from manet. The Routing algorithm are not consider for Energy Efficient during routing attacks, which leads to message overhead, link failure and consume lot of battery power. So, in our project proposed algorithm EEKBDR(Energy Efficient King-Protea Based Detection and Removal) technique is used to detects malicious black hole nodes from the networks. which also improved the energy consumption by reducing routing overhead, and high battery power consumption. The performance is evaluated for the black hole node detection and removal using Network Simulator 2.34.

Keywords: *Manet's, EETBDR, Blackhole attack, HoneyPot, King-Protea*

OAS0112

EXPERIMENTAL INVESTIGATION ON WATER HARVESTING USING MODIFIED DEWCOLLECTOR

Abiraham, Sureshbabu K, Balusamy T

Department of Mechanical Engineering, Government College of Engineering, Salem-11, Tamil Nadu .

Email: *abraham.rko@gmail.com, ksureshbabu.ksb@gmail.com, balusamy_t@yahoo.com*

Abstract

A passive condenser surface is made using the Low density polyethylene material (LDPE). The condensersurface is placed 1 m above the ground on a metal frame and thermally insulated with 25mm thick polystyrene foam. For effective collection of dew water, the condenser surface is tilted to a 30° inclination from horizontal. The hollow part of the device thermally insulated, faces the direction of the dominant nocturnal wind. The surface area of the collector is of 0.72 m². The complete setup is installed at study site is located in Salem, Tamil Nadu, India which is represented by Latitude and Longitude 11° 39' 51.5700"N, 78° 8' 45.6396"E and readings are noted for amount of water collected every morning. Survey reveals dewfall occurs eight months in a year while rainfall occurs four months at the study site.

For a One month reading, a 1.44 L/m² per day yield were calculated. So, considerably large amount of water can be recovered from air by this method. This paves the way for reducing the water crisis in urban, arid and semi-arid regions and also reduces the fresh water demand considerably.

Keywords: *Low Density Polyethylene, Polystyrene Foam, Dew Water.*

OAS0114

IMPLEMENTATION OF ANALYSIS SYNTHESIS FILTER BANK

¹Sajan P Philip, ²Sharavanan S, ²Thirumoorthi P

Department of electronic and communication engineering, BIT, Sathy

Email: sajanpphilip@bitsathy.ac.in, sharavanan.ec14@bitsathy.ac.in, thirumoorthi.ec14@bitsathy.ac.in

Abstract

This project is about the comparison of numbers of different filter bank approaches which include discrete Fourier transform (DFT) filter bank, multirate digital filter bank, modified discrete Fourier transform (MDFT) filter bank, and cosine modulated filter bank. Filter banks find application in communications, speech processing, image compression, antenna systems, analog voice privacy systems, and in the digital audio industry. During the last several years there has been substantial progress in multirate system research. This includes design of decimation and interpolation filters, analysis/synthesis filter banks. Simulation results show that there is no one best overall method that gives the best performance. Multirate digital signal processing (DSP) has attracted much attention over the past two decades due to the applications in sub band coding of speech, audio and video, multiple carrier data transmission, etc. A key characteristic of multirate algorithms is their high computational efficiency. In recent years digital filter banks have been occupying an increasingly important role in both wireless and wired communication systems.

Keywords: *filter bank; Kaiser Filter; frequency response; decimation; interpolation.*

OAS0118

SOIL AND MOISTURE SENSORS IN AGRICULTURE

R.C.Vignesh, S.Sivaramasundram

Dept of Biotechnology, Karunya Institute of Technology, Karunya university, Coimbatore

Abstract

Many soil moisture sensors are available for measuring either soil moisture or soil moisture tension. The later measures the amount of water retained by the soil higher the tension drier the soil. Both soil moisture measurement and the ET based irrigation scheduling can be used as a tool to evaluate the effectiveness and accuracy of an irrigation strategy. Evapotranspiration (ET) soil water estimation should be periodically validated using soil moisture sensors comparing predicted soil moisture with actual soil moisture is a good strategy to confirm the ET based scheduling method is accurate. The types of soil moistures are used. Depending upon the moisture content present in different areas, these sensors can be used to measure the moisture and supply the required water at the right time without the use of man

power and with the minimum wastage of water. Soil moisture sensors must be in direct contact with the undisturbed soil in order to provide accurate readings. During installation, damage to the root and soil structure should be minimized and air voids, large roots, rocks and other obstruction should be avoided. Soil measurement should be used in combination with the ET based irrigation scheduling. Before installing infield calibration should be conducted on the sensors to help provide accurate reading.

OAS0132

ENCRYPTION OF DATA IN HADOOP USING KUBER ALGORITHM

Anand S

Department of Information Technology, MCET, Pollachi, Coimbatore , India

Email: anandselva3091996@gmail.com

Abstract

Encryption of Data in Hadoop using Cha-cha 20 Algorithm and Authentication using Kerberos algorithm. Chacha-20 encrypts the files at a faster rate than AES algorithm and chacha-20 is suitable for encryption of data's of same size. Though chacha-20 is an efficient algorithm in terms of speed of encryption it lacks in performance when data size varies. Chacha-20 algorithm is found to be more effective only if the size of the input data is found to be at some constant size. In this process the encryption of data at rest and in motion from HDFS using KUBER algorithm with java GUI (Graphical User Interface). KUBER algorithm is used for encryption and decryption of the data in HADOOP Environment. It processes the single node in HADOOP and also create a java API. It is better user interface using GUI for giving input and for viewing output and efficient algorithm for encryption and decryption. HADOOP is a tool used for processing large set of data. It's also a fact that the data in the HDFS can be used by any other HADOOP users. So familiar with accessing the HDFS where the data is at rest and in other hand when the data is transferred over a network. It is also vulnerable for cipher attacks. In order to overcome those issues, we have implemented the usage of KUBER encryption in this paper in addition to that of AES a default traditional algorithm used in HADOOP for encryption.

POSTER PRESENTATIONS

BCE0103

BIOLOGICAL TOXINS OF POTENTIAL BIO-TERRORISM RISK- DETECTION AND IDENTIFICATION TECHNOLOGY

Shinny Beulah, Meenakshi.S

*Department of Biotechnology, Karunya Institute of Technology & Sciences, Karunya University,
Coimbatore-641 114.*

Email: shinny6beulah@gmail.com, meenakshi@karunya.edu.in

Abstract

Biological toxins are a heterogeneous group of compounds that share commonalities both with biological and chemical agents. Based on their availability, toxicity, and the lack of medical counter measures as well as their known history of military research, toxins such as ricin, botulinum neurotoxins, staphylococcal enterotoxins, and saxitoxin are classified as toxins of bioterrorism risk. At the same time, they are known to cause naturally occurring intoxication. Different technologies for toxin detection have been established, but hardly any universally agreed reference methods or reference materials are available. Regular proficiency tests have been lacking for most of the mentioned toxins. Therefore, objective comparison of method performance has not been possible. The recently completed EU-funded project EQuATox delineated the current status quo of toxin detection on the basis of a series of proficiency tests. This review provides an overview of the results obtained and highlights the need for future developments in the field.

Keywords: *Biological toxins, Ricin, Botulinum neurotoxin, Staphylococcal enterotoxin, Saxitoxin, Standardization, Proficiency testing*

FN0103

ULTRASOUND ASSISTED EXTRACTION OF POLYPHENOLS FROM COCCINIA GRANDIS L AND OPTIMIZATION USING RESPONSE SURFACE METHODOLOGY

Jeeva Senrayan, Sivakumar Venkatachalam*

*Food Process Engineering Lab, Department of Chemical Engineering, A C Tech,
Anna University, Chennai-600 025.*

Email: *drvsivakumar@yahoo.com, jeevaasenrayan@gmail.com

Abstract

Polyphenols are natural antioxidants in plants, especially in fruits and vegetables, which have a vital role in human health. *Coccinia grandis* L is a source of bioactive phytochemicals. The objective of the study was to extract the total phenolic content (TPC), total flavonoid content (TFC) and total anthocyanin content (TAC) from *Coccinia grandis* L using ultrasound assisted extraction technique. Response surface methodology (RSM) based on a three-level three-factor Box-Behnken response surface design (BBD) was employed to optimize the extraction conditions (solid-liquid ratio, temperature and extraction time). Analysis of variance (ANOVA) showed that the contribution of a quadratic model was significant for the extraction yield. Second-order polynomial models were developed using multiple regression analysis. The experimental yield was obtained under the optimal condition was well agreement with predicted values. The highest extraction yield was obtained through the solvent methanol at 80% concentration

level, whereas UAE was a more efficient technique and yielded comparatively higher polyphenol contents than conventional extraction methods.

Keywords: *Coccinia Grandis L, Ultrasound assisted extraction, Polyphenols, Flavonoids, Anthocyanins, optimization.*

FN0105

HEALTH BENEFITS OF MARINE ALGAE (SEAWEED)

R.M.Karthika, K.Karthikeyan, J.PrakashMaran, R.RamaJeba

*Department of Food Science and Nutrition, Periyar University, Periyar Palkalai Nagar,
Salem, Tamil Nadu, India-636011*

Email: profkarthi@periyaruniversity.ac.in, prakashmaran@periyaruniversity.ac.in

Abstract

In recent year research interest on the aquatic ecosystem plays a vital role because of its attractive natural creation as well as its health benefits. Among the various marine resources, marine algae (seaweeds) are plant like organisms generally attached to rock and other hard substrata in coastal areas specially it falls into three different broad categories such as groups red algae (Rhodophyta), brown algae (Phaeophyta), green algae (Chlorophyta) based on their pigmentation. Seaweeds have always been of great interest in Asian culture and used in terms of not only as a food source but also used as sources of gelling or thickening agents. Seaweeds are low-calorie foods with a high concentration of minerals (Mg, Ca, P, K and I), vitamins, proteins, carbohydrates, and low content of lipids. In addition to that, it possesses more functional activities such as antioxidant, anti-mutagenic, anticoagulant, antitumor activity etc. The objectives of this study are to review the seaweeds bioactive components and its health beneficial effects on human health.

Keywords: *Algae; Seaweed; Health benefits; Bioactive compounds.*

FN0109

AN INCREASE IN THE OMEGA -3/OMEGA-6 FATTY ACID RATIO INCREASE THE RISK FOR OBESITY

Thilakar.T, Indirasenan.M

*Department of Petrochemical Engineering, RVS College of Engineering and Technology, Coimbatore-
641402.*

Email: thilakarvasan@gmail.com

Abstract

In the past three decades, total fat and saturated fat intake as a percentage of total calories has continuously decreased in Western diets, while the intake of omega-6 fatty acid increased and the omega-3 fatty acid decreased, resulting in a large increase in the omega-6/omega-3 ratio from 1:1 during evolution to 20:1 today or even higher. Experimental studies have suggested that omega-6 and omega-3 fatty acids elicit divergent effects on body fat gain through mechanisms of adipogenesis, browning of adipose tissue, lipid homeostasis, brain-gut-adipose tissue axis, and most importantly systemic inflammation. Prospective studies clearly show an increase in the risk of obesity as the level of omega-6

fatty acids and the omega-6/omega-3 ratio increase in red blood cell (RBC) membrane phospholipids, whereas high omega-3 RBC membrane phospholipids decrease the risk of obesity. Recent studies in humans show that in addition to absolute amounts of omega-6 and omega-3 fatty acid intake, the omega-6/omega-3 ratio increases the development of obesity via both AA eicosanoid metabolites and hyperactivity of the cannabinoid system, which can be reversed with increased intake of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). A balanced omega-6/omega-3 ratio is important for health and in the prevention and management of obesity.

Keywords: *Obesity; omega-6 and omega-3 essential fatty acids; omega-6 and omega-3 fatty acid ratio; eicosanoids; browning of adipose tissue; endocannabinoids*

NT0102

Portable Water Filter Bottle using Nanotechnology

Roopali.T, Reshma.T, Yuvashree.P

*Department of Electronics and Communication Engineering, Bannari Amman Institute of Technology,
Sathyamangalam.*

Email: roopali.ec16@bitsathy.ac.in

Abstract

Basically, a filter is like a sieve. If we have larger holes it helps to let the water flow through at a faster rate since small holes limits how much water can flow through quickly. Also, small pore size on a filter doesn't remove dissolved chemical contaminants on its own and sometimes the trapped bacteria and other microorganisms can start growing in the filter. So we use a material called Carbon nanotube membranes since it can remove almost all kinds of water contaminants including turbidity, oil, bacteria, viruses and organic contaminants. Although their pores are significantly smaller carbon nanotubes have shown to have an equal or a faster flow rate as compared to larger pores, possibly because of the smooth interior of the nanotubes. They are extremely good at conducting electricity. It means we can hook up a power source to our filter and electrify it. We're doing electrochemistry now as the water runs through the filter electricity degrades the bacteria and viruses and other contaminants that build up the filter to help keep it clean and slow filter fouling, so we don't need to clean or replace the filter as often. Thus this paper has been proposed to make a big difference for our large-scale water treatment using this great technology of self-cleaning.

Keywords: *Nanotechnology, Carbon nanotube.*

NT0103

NANO TECHNOLOGY

Nithish. A, Akhilesh K. R

Sri Krishna Adithya College of Arts and Science, KovaiPudur, Coimbatore-641042, Tamil Nadu

Email: nithishyuv1413@gmail.com

Abstract

Nanoscience specially refers to the study of objects that are very tiny and are in the range of ten to hundreds of nanometers. Nanotechnology, on the other hand, is the actual manipulation, application and use of nanometer -sized objects and matter to produce different phenomenon, or for specific technologies and application. Nanoscience refers to anything that is in the particular size that is studied, or used for Nanotechnology and Nanoscience. Humans have been unknowingly using nanotechnology and nanoscience for hundreds of years. The creation of steel swords for example, could be said to be an example of applied technology.

Keyword: *Tiny, Nanometers, Manipulation, Application, Nanoscience*

RE0103

**A SURVEY ON AWARENESS OF USING GASIFIED BIOFUELS FOR
INDIAN ENVIRONMENTAL AND ECONOMIC GROWTH**

Pitchaimuthu.B, Thiruvarasu.P, Ajaymano.M, Dr.M.Seenuvasan
SVS College of Engineering, Coimbatore-64219, Tamil Nadu.
Email: rainamuthu33@gmail.com, thiruvarasan12345@gmail.com

Abstract

Current liquid fuels address environmental issues including Greenhouse effect, air pollution, global warming and climate change. The biofuel policy aims to promote the use in transport of fuels made from biomass, as well as other renewable fuels. Biofuels provide the prospect of new economic opportunities for people in rural areas, in oil importer and developing countries. The central policy of biofuel concerns job creation, greater efficiency in the general business environment and protection of the environment. Nowadays mostly we are focusing to convert biomass to liquid fuels not to convert into gaseous fuels. We have to focus on converting gaseous fuels; it provides energy services with zero or almost zero emissions of both air pollutants and greenhouse gases. Biofuels are expected to reduce dependence on imported petroleum, reduce greenhouse gas emissions and other pollutants, and build up the economy by increasing demand and prices for agriculture products.

Keywords: *Environmental hazards, Gasified-biofuels, Economic growth.*

WWT0108

**WASTEWATER TREATMENT, RECYCLE AND REUSE: PAST,
PRESENT, AND FUTURE**

Sakthivel.K, Hari Shankar. G
Sri Krishna Adithya College of Arts and Science, Coimbatore, India
Email: svel73312@gmail.com

Abstract

This paper provides an overview of the Special Issue on Wastewater Treatment and Reuse: Past, Present, and Future. The papers selected for publication include advanced wastewater treatment and monitoring technologies, such as membrane bioreactors, electrochemical systems; denitrifying biofilters, and disinfection technologies. The Issue also contains articles related to best management practices of biosolids, the influence of organic matter on pathogen inactivation and nutrient removal. Collectively, the Special Issue presents an evolution of technologies, from conventional through advanced, for reliable and sustainable wastewater treatment and reuse.

Keywords: *Bio-electrochemical systems; bioenergy; carbon cycling; denitrifying biofilters; disinfection*

OAS0105

**ADVANCES IN TECHNOLOGY
LIGHT FIDELITY**

N.Dhavaneeswaran, R.Vinothini

Automobile Engineering, Kongu Engineering College, Erode, Tamil Nadu, India

Email: n.dhavanees@gmail.com, pavi.vino1999@gmail.com

Abstract

There are numerous technologies to offer wireless broadband, but Li-Fi is the new way of technology which provide high speed internet. Hence it will provide high speed wireless broadband opportunities in the smart home. This paper focuses on Li-Fi, its applications, features and comparison with existing technologies like Wi-Fi etc. Li-Fi or Light Fidelity refers to Visible Light Communication systems using light-emitting diodes as a medium to high-speed communication in a similar manner as Wi-Fi. The technology is very new and was proposed by the German physicist Harald Haas in 2011 TED (Technology, Entertainment, Design) GlobalTalk on Visible Light Communication (VLC). Li-Fi is a wireless optical networking technology that uses light emitting diodes (LEDs) for transmission of data. Li-Fi provides better bandwidth, efficiency, connectivity and security than Wi-Fi and has already achieved high speeds larger than 1 Gbps under the laboratory conditions. Li-Fi has provided a step forward invention in the world of growing hunger communication, this is safe to all biodiversity including humans and progressing towards a greener, cheaper and brighter future of technologies.

Keywords: LED (Light Emitting Diode), Wi-Fi (Wireless Fidelity),

OAS0107

WOMEN HELPLINE

S.Bhuvana, Ramya.R

Dr. Mahalingam College of Engineering & Technology, Pollachi, Coimbatore.

Email: sangi210atcbe@gmail.com

Abstract

This paper is based on IoT (Internet of Things). In modern India, women continue to face discrimination and other social challenges and are often victims of abuse and violent crimes. Due to these reasons, it has become very important to stay alert and tackle those situations efficiently when they are alone. We propose our paper, Women helpline using mobile app to ensure safety for women's that it will be much helpful in emergency situations. The sender should install pressit app and emergency app in their android mobile. The microcontroller used is Arduino Uno which is an open source platform. During emergency cases women can enable the pressit app when outside. Once the power button is double clicked, the emergency app gets enabled. The receiver consists of GSM module. The location of the person is known and alert message is sent to the control room. LCD is used to display the mobile number and message. Also, the pre-set contacts of the women can easily get an alert message that the woman is in emergency situation.

Keywords: GSM, Arduino Uno, Mobile app, Arduino Uno, LCD.

OAS0108

IMPLEMENTATION OF BIPED ROBOT USING D-THINK ALGORITHM

U.P.Darshan,K.V.VivekRaj,R.S.Kirthanaa,C.Malini

Dr.Mahalingam College of Engineering & Technology, Pollachi, Coimbatore.

Email: kvvivekraj3@gmail.com,kirthanaalatha@gmail.com, malini007@gmail.com

Abstract:

An important research area is Bipedal Robots and their exists several types of robots like WABIAN-2R, QRIO, ASIMO, REEM-B, NAO, Toyota I Foot and HPR-2. There is a rapid increase in building a bipedal and humanoid robot during the last few years. Biped robots are 2-legged robots which can imitate human gait. Biped robots have better mobility than conventional wheeled robots, but they tend to tip over easily. To be able to walk stably in various environments, such as on rough terrain, up and down slopes, or in regions containing obstacles, it is necessary for the robot to adapt to the ground conditions with a foot motion, and maintain its stability with a torso motion. Biped robot using d-think algorithm represents the first steps toward generating robotic walking and image processing by using viola-jones algorithm. It implements the motion planning method of a biped robot that can able to observe and make decision like humans (i.e., to imitate human walking pattern) and the robot should adopt for any surfaces example: staircase, flat surface. It will compare and provide best option between the ones by capturing images from the data set and also one can see the captured images from mobile. This project implements a prototype model of a humanoid robot with minimalistic hardware in order to maintain stability and make it economically viable and hence extract maximum uses from this intelligible design.

OAS0115

SKILL SET ANALYSIS PORTAL

M.Harshavarthan,S.RaguBalaji,P.Aravinthan,C.Kokilambal

*Department of Computer Science Engineering, Dr.Mahalingam College of Engineering and Technology
Pollachi, Coimbatore.*

Email: harshamaran95@gmail.com,ragubalaji15@gmail.com.com,aravindofficials@gmail.com,
kokichidambaram@gmail.com

Abstract

Cloud Computing is an emanating technology that allows users to perform data processing,storage and admission services around the world throughout the internet. Candidates who are dropouts with good skills are unemployed, since their skills are not revealed. In addition to this, identification of a well-known person in a particular domain is difficult. It is easy for the recruiters to find the person who good in a particular field. This project tries to make candidate's profile globally accessible. It is achieved by developing and deploying it in cloud. It helps to implement the skill based education system. It makes the recruiters to find the eligible candidates in an easiest way. Profile is created for the candidate's to maintain their update on skills. Using Multi Keyword Ranked Search technique, it has now become simple to find out the candidate in a particular field. Usage of data and documents in the cloud has been increased, it is important to allow search multiple keywords in a document and return the relevant data according to the search of a given keyword. If a keyword is given, the words that are related to the keywords are displayed.

In this paper, Multi-Keyword Ranked Search over data in cloud computing. Queries are transferred to the server. Server searches the relevant data and sends the result to the user.

Keywords: *Cloud Computing, Data Processing, Multi-Keyword Search.*

OAS0119

TOWARDS 5G EMERGING TECHNOLOGIES

M.Sindhuja, R. Bhavadarini

Department of Computer Technology, Sri Krishna Adithya College of Arts and Science, Coimbatore.

Email: sinja0205@gmail.com

Abstract

5G (5th generation mobile networks) stand for the next major phase of mobile telecommunications standards beyond the current 4G/IMT Advanced standards. 5G has speeds further what the present 4G can provide. From generation 1G to 2.5G and from 3G to 5G this world of telecommunication has seen a number of advancement along with improved performance with every passing day. This fast change in mobile computing gives us change our day to day life that is way we work, interact, learn etc. This paper also highlight on all preceding generations of mobile communication along with fifth generation technology. The development of 5 G technologies is a cornerstone for realizing breakthroughs in the transformation of ICT network infrastructure. Ultra broadband and intelligent-pipe network features that achieve near- instantaneous, “zero distance” connectivity between people and connected machines – no matter where they are – are just the first step. In this paper also we discuss architecture, waveform concept, requirements etc.

Keywords: *5G, zero distance, speed, performance.*

OAS0120

MOBILE CLOUD COMPUTING: ISSUES, SECURITY, ADVANTAGES, AND TRENDS

Varshini A, Bhuvaneswari S

Department of Computer Technology, Sri Krishna Adithya College of Arts and Science, Coimbatore.

Email: manuvvarshini1@gmail.com

Abstract

Now days the market of mobile phone is growing at a very high speed. Everyone has a mobile, tablet, fablet (tablet with calling facility). Mobile user will reach 6.5 billion by the end of 2012, 6.9 billion by the end of 2013. Together with an explosive growth of the mobile applications and emerging of cloud computing concept, mobile cloud computing (MCC) has been introduced to be a potential technology for mobile services. MCC integrates the cloud computing into the mobile environment and overcomes obstacles related to the performance (e.g., battery life, storage, and bandwidth), environment (e.g., heterogeneity, scalability, and availability), and security (e.g., reliability and privacy) discussed in mobile computing. This paper gives information about mobile Cloud computing application, security, issues. The issues, existing solutions and approaches are presented.

Keywords: *Mobile cloud computing, data storage, mobile user.*

OAS0121

A SURVEY ON MOBILE AD-HOC NETWORKS

T.Sakthyvel, M.Muthubalaji

Department of Computer Technology, Sri Krishna Adithya College of Arts and Science, Coimbatore.

Email: muthubalaji1706@gmail.com

Abstract

Most ad hoc mobile devices today operate on batteries. Hence, power consumption becomes an important issue. To maximize the lifetime of ad hoc mobile networks, the power consumption rate of each node must be evenly distributed, and the overall transmission power for each connection request must be minimized. These two objectives cannot be satisfied simultaneously by employing routing algorithms proposed in previous work. In this article we present a new power-aware routing protocol to satisfy these two constraints simultaneously; we also compare the performance of different types of power-related routing algorithms via simulation. Simulation results confirm the need to strike a balance in attaining service availability performance of the whole network vs. the lifetime of ad hoc mobile devices

OAS0122

**DRAW BASED GRAPHICAL PASSWORD SCHEME IMAGE
PROCESSING**

Dhivakar.K,Dineshkumar.R

Sri Krishna College Of Arts And Science, Coimbatore.

Email: dhivakar799@gmail.com,dineshkumarr123@gmail.com

Abstract

Now a day, graphical password is used as an alternative to text-based passwords, biometric and tokens. We use Graphical passwords because people can remember images better than the text. The Graphical passwords are divided into three categories: click-based graphical password, choice-based graphical password and draw-based graphical password. In this paper, we combine the features of these three methods. Our proposed system is mainly the combination of Persuasive Cued Click Points and click-draw based graphical password scheme (CD-GPS). In this, users first choose an ordered sequence of 5 images and then select single image to click-draw their secrets. On remaining 4 images we select click points using features of PCCP (viewport and shuffle button). At the time of login images appear as per the decided sequence. For login user should click on the images for which we used features of PCCP for password creation and user should draw a secret on the previously selected image. By adding feature of secret drawing to PCCP, attackers fail to know that there is use of secret drawing technique on an image in between these images, unfortunately if they know about secret drawing, they don't get exact idea that on which image secret has to be done. Our proposed system provides higher security than other techniques.

Keywords: Authentication, Graphical Password, images, security.

OAS0123

**PROTECTION OF MEDICAL IMAGES IN HEALTHCARE USING
REVERSIBLE WATERMARKING TECHNIQUE**

Sundaram S M

Department of Information Technology, MCET, Pollachi, Coimbatore

Email: sundaramsm18@gmail.com

Abstract:

This work presents GUI application with an intelligent technique based on reversible watermarking and LSB algorithm for protecting patient and medical related information. In the proposed technique the concept of hide text function is to hide the patient information that read from a text file to the patient's medical images using LSB algorithm. In the proposed technique the concept of find text function is to retrieve the patient information that read stored into the medical image. The original information was decrypted from the extracted encrypted information. The proposed technique is effective with respect to capacity and imperceptibility and effectiveness is demonstrated through experimental comparisons with existing techniques using standard images as well as a publically available medical image dataset.

Keywords: *LSB algorithm, proposed technique, encrypted, demonstrated*

OAS0125

**CLUSTERING DATA STREAMS BASED ON THE SHARED DENSITY
BETWEEN THE MICRO-CLUSTERS**

B.Raj Kumar

Sri Krishna College of Arts and Science, Coimbatore.

Email: imkumar281@gmail.com

Abstract

As more and more applications produce streaming data, clustering data streams has become an important technique for data and knowledge engineering. A typical approach is to summarize the data stream in real-time with an online process into a large number of so called micro-clusters. Micro-clusters represent local density estimates by aggregating the information of many data points in a defined area. On demand, a (modified) conventional clustering algorithm is used in a second offline step to re-cluster the micro clusters into larger final clusters. For re-clustering, the centers of the micro-clusters are used as pseudo points with the density estimates used as their weights. However, information about density in the area between micro-clusters is not preserved in the online process and re-clustering is based on possibly inaccurate assumptions about the distribution of data within and between micro-clusters. This paper describes DBSTREAM, the first micro-cluster- based online clustering component that explicitly captures the density between micro-clusters via a shared density graph. The density information in this graph is then exploited for re-clustering based on actual density between adjacent micro-clusters. We discuss the space and time complexity of maintaining the shared density graph. Experiments on a wide range of synthetic and real data sets highlight that using shared density improves clustering quality over other popular data stream clustering methods which require the creation of a larger number of smaller micro clusters to achieve comparable results.

Keywords: *clustering data, algorithm, component, complexity*

OAS0133

**ENHANCEMENT OF CLOUD COMPUTING SECURITY WITH SECURE
DATA STORAGE USING AES**

RoshansanjuR, Vinit R

Department of Electrical and Electronics engineering

Narasu'ssarathy institute of technology, Poosaripatti, Salem -636305

Email: roshansanjuknair@gmail.com

Abstract

The evolution of Cloud computing makes the major changes in computing world as with the assistance of basic cloud computing service models like SaaS, PaaS, and IaaS an organization achieves their business goal with minimum effort as compared to traditional computing environment. On the other hand security of the data in the cloud database server is the key area of concern in the acceptance of cloud. It requires a very high degree of privacy and authentication. To protect the data in cloud database server cryptography is one of the important methods. Cryptography provides various symmetric and asymmetric algorithms to secure the data. This paper presents the symmetric cryptographic algorithm named as AES (Advanced Encryption Standard). It is based on several substitutions, permutation and transformation.

Keywords: *Cloud Computing, Security, Cryptography, AES*

OAS0134

RESEARCH ON WIRELESS SENSOR NETWORK TECHNOLOGY

Chandru.G, Saravanakumar. A

Sri Krishna Adithya College Of Arts And Science, Coimbatore, India

Email: yadavchandru888@gmail.com

Abstract

As wireless sensor technology improves; an increasing number of organizations are using it for a wide range of purposes. ZigBee technology is a new standard in wireless personal area after Bluetooth. After an introduction to this technology, a new wireless meter-reading system based on ZigBee protocol has evolved. This system, which is comprised of ZigBee network and database management system, has many important advantages such as low cost, low power consumption, and low data rate. Wireless Sensor Network based on ZigBee technology is a wireless network which is composed of many nodes of ZigBee RF chip, sensor and MCU, especially suitable for application of the remote monitoring system in flammable and explosive environment. Fusion of RFID and ZigBee is also possible which turns out to be a boon for wireless sensor network technology. A complete overview of wireless sensor network technology is given in this paper. Wireless sensor network technology has become one of the technological basic needs of us.

Keywords: *Bluetooth, networking, protocol, RFID.*

OAS0137

**HOMOMORPHIC ENCRYPTION ON IMAGE PROCESSING USING
MORE APPROACH**

Muthu Kumar S, Vinieth S S, Dr. S. Ramakrishnan

*Department of Information Technology, Dr. Mahalingam College of Engineering and Technology, NPT-
MCET Campus,*

Pollachi, Coimbatore – 642 003,

Email: muthukumar4999@gmail.com

Abstract

Image is one of the most important information representation styles and widely used in most of the applications. Images are often exchanged between two parties over the insecure network. In order to protect the images from interception, the shared images should be encrypted before transmission. Encryption is one of the most common techniques used for preserving user data privacy, but sometimes users are enforced to reveal their secret encryption keys to some parties for processing operations over their sensitive data. Homomorphic Encryption (HE) is new cryptographic research topic that was introduced to help users in preserving their data confidentiality and privacy by allowing un-trusted parties to process computations over encrypted data. Homomorphic Encryption algorithm allows computation over the encrypted data is required in real world modern applications to preserve the privacy. Asymmetric approaches suffer from high computation overhead, while symmetric approaches suffer from low immunity against attacks such as chosen and known plaintext attack. So, we consider symmetric approaches and we focus on Matrix Operation for Randomization and Encryption (MORE) approach to build a new algorithm

Keywords: Homomorphic, Encryption, Asymmetric, Matrix Operation

OAS0138

SMART HOME USING INTERNET OF THINGS

B. Moulieswaran 1 J. Sunil 2

*Dept of Electronics and Instrumentation engineering Dept of Electronics and Instrumentation
engineering*

SNS college of Technology, Coimbatore

Moulieswaran03@gmail.com, sp788397@gmail.com

Abstract

With advancement of Automation technology, Life is getting simpler and easier in all aspects. In today's world automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object from industrial machine to Consumer goods that can share information and complete Tasks while you are busy with other activities. Wireless Home Automation system (WHAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet

from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the World through internet connection. In this paper we present a Home Automation system (HAS). Using Intel Galileo that employs the integration of cloud networking, wireless communication, to provide the user with remote control of various lights, fans, and appliances within their home and storing the data in the cloud. The system will automatically change on the basis of sensors' data. This system is designed to be low cost and expandable allowing a variety of devices to be controlled.

Keywords: *Automation, emerging internet technology, Intel Galileo, integration*



Department of Chemical Engineering,
Kongu Engineering College,
Perundurai, Erode - 638060, India.

